

SUPPLEMENTAL MATERIAL

Improving Temporal Trends in Survival and Neurological Outcomes after Out-of-Hospital Cardiac Arrest

Appendix 1. List of Collaborators for Rescu

Rescu Epistry Investigators:

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Paramedic and Fire Services (Rescu Epistry Collaborators):

Region of Durham Paramedic Service

Halton Region Paramedic Service

Muskoka Paramedic Services

Peel Regional Paramedic Services

County of Simcoe Paramedic Services

Toronto Paramedic Services

York Region Paramedic Service

Ornge

Ajax Fire and Emergency Services

Brampton Fire and Emergency Services

Clarington Emergency and Fire Services

Mississauga Fire and Emergency Services

Pickering Fire Services

Toronto Fire Services

Uxbridge Fire Department

Whitby Fire and Emergency Services

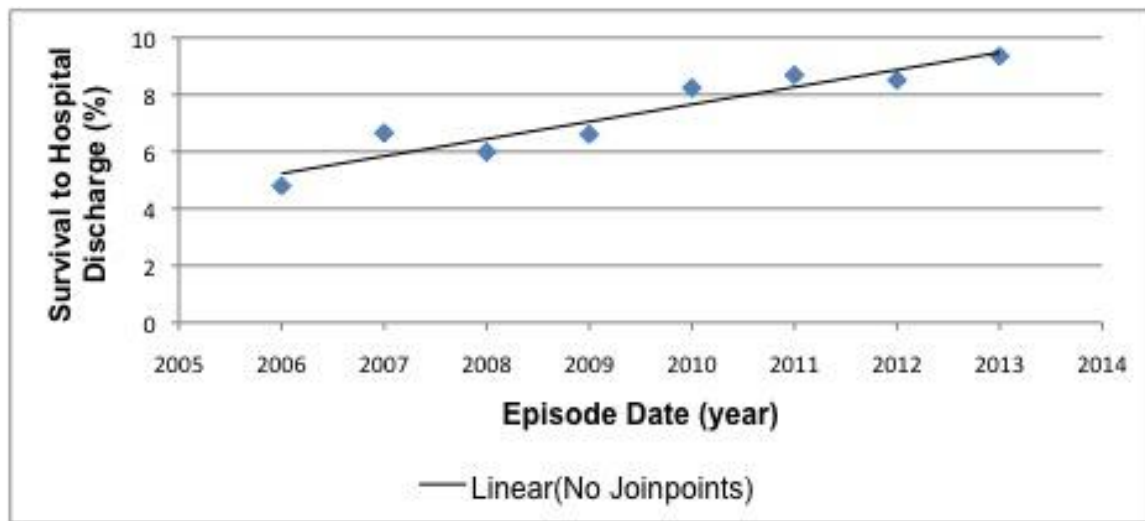
Appendix 2. List of Destination Hospitals for Rescu Epistry (2016):

1. Lakeridge Health - Port Perry
2. Lakeridge Health - Oshawa
3. Lakeridge Health - Bowmanville
4. Rouge Valley - Ajax/Pickering
5. Rouge Valley - Centenary
6. Markham Stouffville Hospital
7. Markham Stouffville Hospital - Uxbridge Cottage
8. Collingwood General and Marine Hospital
9. Royal Victoria Hospital
10. Stevenson Memorial Hospital
11. Southlake Regional Health Center
12. Orillia Soldiers Memorial Hospital
13. Georgian Bay General Hospital
14. Muskoka Algonquin Healthcare - Bracebridge
15. Muskoka Algonquin Healthcare - Huntsville
16. Scarborough Grace
17. Scarborough General
18. Mackenzie Health (formally York Central Hospital)
19. Michael Garron Hospital (formally Toronto East General Hospital)
20. Sunnybrook Health Sciences Centre
21. University Health Network - Toronto Western
22. University Health Network - Toronto General

23. Hospital for Sick Kids
24. St. Michael's Hospital
25. North York General Hospital
26. Mount Sinai Hospital
27. Halton Healthcare - Oakville Trafalgar Memorial Hospital
28. Halton Healthcare - Milton District Hospital
29. Halton Healthcare - Georgetown Hospital
30. Joseph Brant Memorial Hospital
31. St. Joseph's Hamilton
32. Hamilton General
33. Hamilton Health Sciences Center - Henderson Hospital (formally Juravinski)
34. Hamilton Health Sciences Center - McMaster University Medical Center
35. Credit Valley Hospital
36. Trillium Health Centre
37. William Osler Health System - Brampton Civic Hospital
38. William Osler Health System - Etobicoke General Hospital
39. Humber River - Finch Site (closed October 2015)
40. Humber River - Church Site (closed October 2015)
41. St. Joseph's Health Centre
42. Headwaters Health Care Centre

* Humber River - Finch Site and Humber River - Church Site were closed in October 2015. They were merged and became Humber River Hospital - Wilson Site.

Appendix 3. Jointpoint Analysis



Appendix 4. Logistic Regression Results for Primary Outcomes (adjusting for season)

<u>Effect</u>	Survival to Hospital Discharge		Functional Survival to Hospital Discharge	
	<u>Adjusted OR (95% CI)</u>	<u>p-value</u>	<u>Adjusted OR (95% CI)</u>	<u>p-value</u>
Age (per year)	0.97 (0.97-0.98)	<0.0001	0.97 (0.97 - 0.98)	<0.0001
Female Sex	1.00		1.00	
Male Sex	0.91 (0.79 - 1.05)	0.200	0.91 (0.75 - 1.11)	0.344
Initial Rhythm (Non-Shockable)	1.00		1.00	
Initial Rhythm (Shockable)	10.34 (9.00 -11.86)	<0.0001	12.72 (10.49 - 15.42)	<0.0001
Private Location	1.00		1.00	
Public Location	1.69 (1.48 - 1.93)	<0.0001	1.62 (1.35 - 1.95)	<0.0001
Unwitnessed with No Bystander CPR	1.00		1.00	
Unwitnessed with Bystander CPR	0.96 (0.72 - 1.30)	0.807	0.93 (0.62 - 1.38)	0.708
Bystander Witnessed with Bystander CPR	2.95 (2.37 - 3.66)	<0.0001	2.79 (2.07 - 3.78)	<0.0001
Bystander Witnessed with no Bystander CPR	2.39 (1.92 - 2.99)	<0.0001	2.33 (1.70 - 3.18)	<0.0001
Paramedic Witnessed	9.58 (7.68 - 11.97)	<0.0001	10.05 (7.38 - 13.67)	<0.0001
Response Time (per minute)	0.90 (0.88 - 0.93)	<0.0001	0.89 (0.86 - 0.92)	<0.0001
Episode Date (per year)	1.12 (1.09 - 1.15)	<0.0001	1.13 (1.05 - 1.22)	0.001
Winter Season	1.00		1.00	
Fall Season	1.04 (0.88 - 1.23)	0.677	1.29 (1.02 - 1.63)	0.033
Spring Season	1.12 (0.94 - 1.32)	0.200	1.36 (1.08 - 1.72)	0.010
Summer Season	1.12 (0.94 - 1.33)	0.202	1.39 (1.09 - 1.76)	0.007
Area Under the Curve	0.876		0.889	

Appendix 5a. Reclassification of Initial Rhythm

	VF/VT	PEA	Asystole	AED (No Shock)	Indeterminate	Missing
Survival to Hospital Discharge						
In Epistry	5073	4811	9428	3565	52	690
Initial Rhythm (3 categories)	5073	4811	9428			4307
Initial Rhythm (2 categories)	5073	17804				742
Functional Survival to Hospital Discharge						
In Epistry	2784	2971	5581	1877	22	398
Initial Rhythm (3 categories)	2784	2971	5581			2208
Initial Rhythm (2 categories)	2784	10340				420

Appendix 5b. Logistic Regression Results for Primary Outcomes (reclassifying Initial Rhythm)

<u>Effect</u>	Survival to Hospital Discharge		Functional Survival to Hospital Discharge	
	<u>Adjusted OR (95% CI)</u>	<u>p-value</u>	<u>Adjusted OR (95% CI)</u>	<u>p-value</u>
Age (per year)	0.97 (0.97 - 0.98)	<0.0001	0.97 (0.97 - 0.98)	<0.0001
Female Sex	1.00		1.00	
Male Sex	0.92 (0.79 - 1.05)	0.204	0.91 (0.75 - 1.11)	0.357
Initial Rhythm (Non-Shockable)	1.00		1.00	
Initial Rhythm (Shockable)	10.33 (8.99 - 11.86)	<0.0001	12.65 (10.44 - 15.33)	<0.0001
Private Location	1.00		1.00	
Public Location	1.69 (1.48 - 1.94)	<0.0001	1.64 (1.36 - 1.97)	<0.0001
Unwitnessed with No Bystander CPR	1.00		1.00	
Unwitnessed with Bystander CPR	0.97 (0.72 - 1.30)	0.817	0.93 (0.62 - 1.39)	0.713
Bystander Witnessed with Bystander CPR	2.96 (2.38 - 3.67)	<0.0001	2.83 (2.10 - 3.82)	<0.0001
Bystander Witnessed with no Bystander CPR	2.40 (1.92 - 3.00)	<0.0001	2.33 (1.71 - 3.19)	<0.0001
Paramedic Witnessed	9.60 (7.69 - 11.98)	<0.0001	10.11 (7.43 – 13.75)	<0.0001
Response Time (per minute)	0.90 (0.88 - 0.93)	<0.0001	0.89 (0.86 - 0.92)	<0.0001
Episode Date (per year)	1.12 (1.09 – 1.15)	<0.0001	1.13 (1.05 – 1.22)	<0.0001
Area Under the Curve	0.876		0.888	

We included 87.6% (20683/23619) of eligible patients in the survival to hospital discharge logistic regression model and 84.9% (11497/13544) of eligible patients in the functional survival to hospital discharge logistic regression model.

Appendix 6. Logistic Regression Results for Primary Outcomes (clustered by paramedic service)

<u>Effect</u>	Survival to Hospital Discharge		Functional Survival to Hospital Discharge	
	<u>Adjusted OR (95% CI)</u>	<u>p-value</u>	<u>Adjusted OR (95% CI)</u>	<u>p-value</u>
Age (per year)	0.97 (0.97-0.98)	<0.0001	0.97 (0.96 - 0.97)	<0.0001
Female Sex	1.00		1.00	
Male Sex	0.92 (0.84 - 1.02)	0.136	0.92 (0.82 - 1.05)	0.219
Initial Rhythm (Asystole)	1.00		1.00	
Initial Rhythm (PEA)	4.70 (3.60 - 6.14)	<0.0001	8.18 (4.21 - 15.90)	<0.0001
Initial Rhythm (VF/VT)	29.11 (22.08 - 38.38)	<0.0001	57.97 (30.61 - 109.79)	<0.0001
Private Location	1.00		1.00	
Public Location	1.61 (1.39 - 1.87)	<0.0001	1.59 (1.34 - 1.87)	<0.0001
Unwitnessed with No Bystander CPR	1.00		1.00	
Unwitnessed with Bystander CPR	0.96 (0.82 - 1.11)	0.555	0.94 (0.62 - 1.42)	0.753
Bystander Witnessed with Bystander CPR	2.38 (1.87 - 3.03)	<0.0001	2.25 (1.61 - 3.15)	<0.0001
Bystander Witnessed with no Bystander CPR	1.95 (1.72 - 2.21)	<0.0001	1.93 (1.51 - 2.46)	<0.0001
Paramedic Witnessed	6.74 (5.00 - 9.08)	<0.0001	7.04 (4.56 - 10.87)	<0.0001
Response Time (per minute)	0.90 (0.87 - 0.92)	<0.0001	0.90 (0.87 - 0.92)	<0.0001
Episode Date (per year)	1.12 (1.10 - 1.14)	<0.0001	1.11 (1.03 - 1.19)	0.004
Area Under the Curve	0.885		0.901	

*Patients were clustered by the seven paramedic services.

We included 76.2% (17978/23619) of eligible patients in the survival to hospital discharge logistic regression model and 76.2% (10321/13544) of eligible patients in the functional survival to hospital discharge logistic regression model.